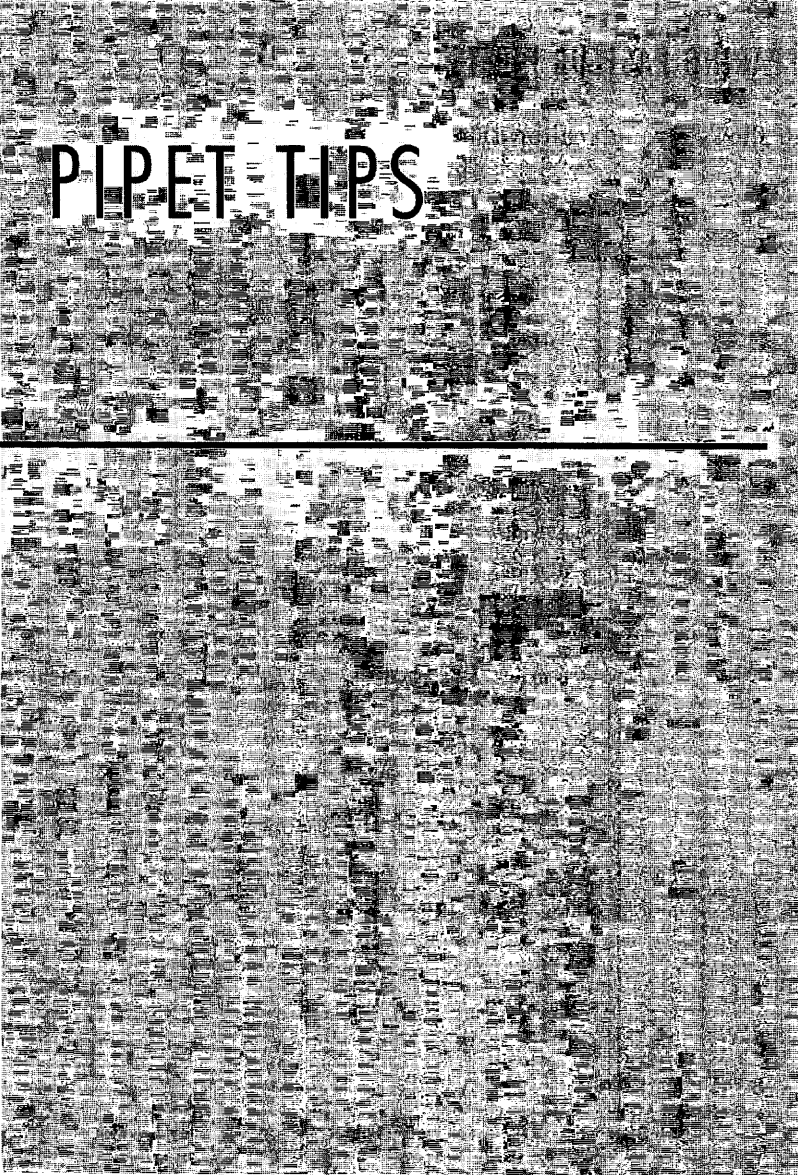


VISIT...

LANZAROTE
Caliente.COM



PIPET TIPS

The Pasteur pipet (Fig. 40) is really handy for *all* scales of laboratory, not just microscale, but it's in microscale that it gets the most use. It usually comes in two sizes, a 9 inch, approximately 3 ml pipet, and a 5 $\frac{3}{4}$ inch, approximately 2 ml pipet.

PRE-PREPARED PASTEUR PIPETS

Figure 40 shows a rough calibration chart for both sizes.

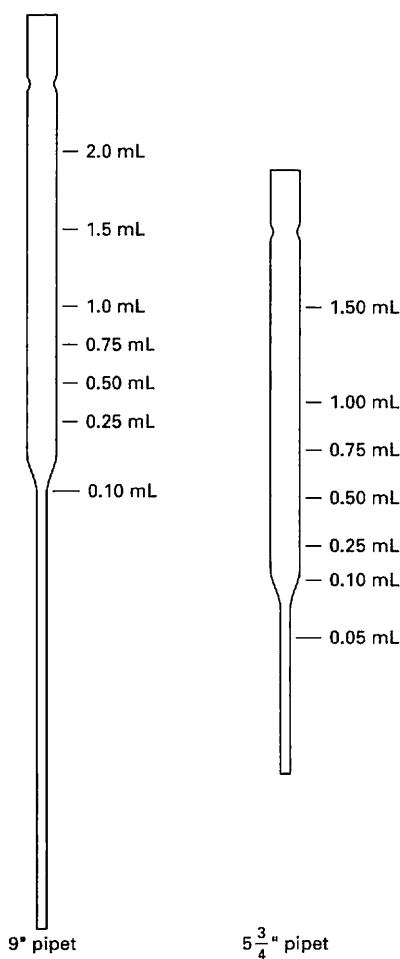


Fig. 40 Pasteur pipets in all their glory.

Calibration

You should get an idea about how high in the pipet 0.5, 1.0, 1.5, and 2.0 ml of liquid are. Just draw measured amounts into the tube and look. I'd mark **one** pipet with all these volumes and keep it as a reference. Marking your working pipets can get messy, especially when the markings dissolve into your product. And scratching a working pipet with a file is asking for trouble. Get the scratch wet, a little lateral pressure and—snap—that's the end of the pipet.

Operation

I know I'm not supposed to have experiments in this book, but here's something I strongly suggest you carry out (Translation: Do It!). Work in a hood. Wear goggles. Don't point the end of a pipet at anyone—yourself included.

Experiment: Get a few millimeters of diethyl ether in a test tube. Fit a Pasteur pipet with a rubber bulb. Warm the pipet in your hand about one minute. Now draw some ether up into the pipet and watch.

If this went at all well, the ether probably came squirting out the end of the pipet. The ether evaporated in the pipet; then vapor filled the bulb and pushed the liquid out. Lots of liquids can do this, and if you've never pipetted anything but water before, the behavior of these liquids is quite striking.

Amelioration

There are two “fixes” to the vapor pressure problem:

1. Pre-wet the pipet with the solvent you'll have in there. Pull in and then expel the solvent two or three times. Once this vapor fills the pipet, the loss of solvent (as previously noted) is much slower, if not stopped. Even so, **be careful**. Don't squeeze or release the bulb rapidly; don't let your hand pre-heat or heat the pipet while handling it.
2. Stick a cork in it. A cotton plug really. Mayo et al. suggest that you push a small cotton ball way down into the narrow part of the pipet with a copper wire, rinse the cotton with 1 ml of methanol and then 1 ml of hexane, and let the cotton dry before use (Fig. 41a). On **all** your pipets. Well, sure, once you get good at it, it won't take all lab period to prepare them. Of course, you could just get good at being careful with this solvent pressure phenomenon.

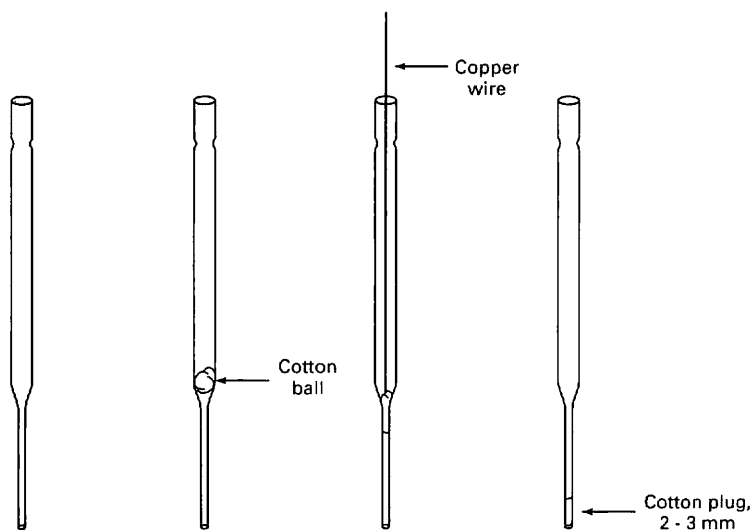
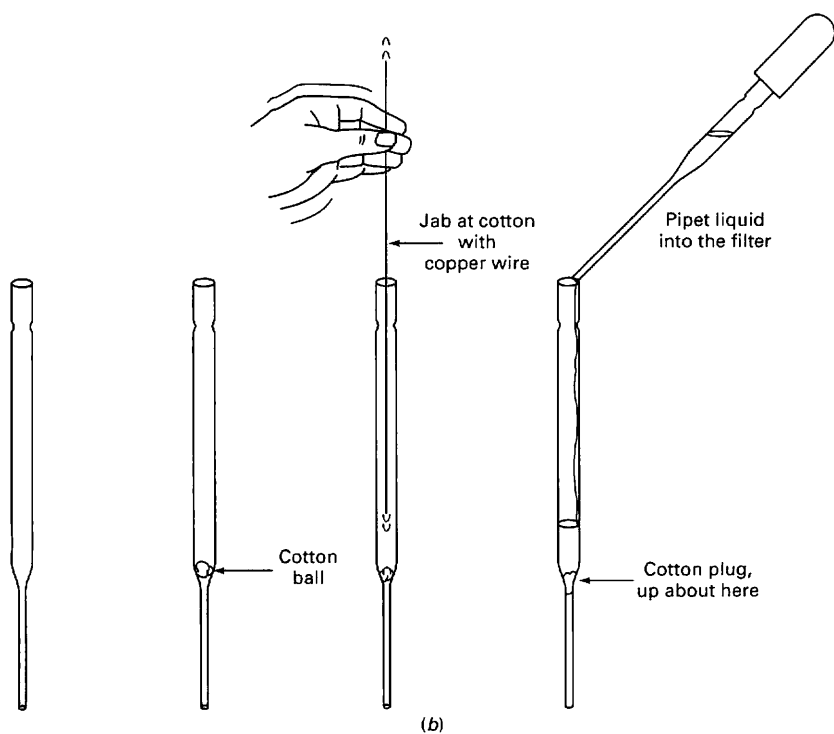


Fig. 41A Pasteur filter pipet—Mayo.



(b)

Fig. 41B Pasteur filter pipet—Zubrick.

I'm told a second advantage of putting cotton in all the pipets is that every time a transfer is made, the material is automatically filtered. Pull material into the pipet, and filth gets trapped on the cotton plug. Squirt the material out, and **all** the filth stays on the cotton. None **ever** washes back out. Yep. Sure. I believe, I believe....In any case, don't use too much cotton! A little here goes a long way.

PIPET CUTTING

From time to time you might need to shorten the long tip of the Pasteur pipet so that the narrow portion is, say, 2–3 cm rather than the 8 cm or so from the 9 inch pipet.

1. Get a sharp triangular file or, better yet, a sharp glass scorer.
2. Support the narrow part of the tip on a raised solid surface such as a ringstand plate.
3. Carefully draw the cutter back toward you while you rotate the pipet away from you. Don't press down too much; you'll crush the tip.
4. Wet the scratch.
5. Using a towel to hold the pipet and to keep from cutting yourself (although the small diameter of the tip makes disaster a bit less likely), position your thumbs to either side of the scratch, with the scratch facing away from you.
6. Read the next two steps before doing anything.
7. Exert force to pull the pipet apart. That's right. Pull first. (The pipet might part here.)
8. If it's still together, while you're **still pulling**, push both thumbs outward.
9. If it hasn't parted yet, either get help from your instructor or don't fool with this one anymore. Get another pipet and try again.
10. Carefully fire-polish the cut end.

7

PIPET FILTERING—LIQUIDS

Real pipet filtering will trap all of the solid materials. For this you need two pipets.

1. Stuff a cotton ball down into the pipet. Then use a wire to repeatedly tamp the cotton into the pipet. Give it 6 to 10 sharp jabs—much as if you were killing the nerves in a tooth during a root canal (Fig. 41b). You don't have to push the cotton all the way into the narrow part of the tip. Just wedge it firmly in the narrows.
2. Get a vial or other receptacle ready to receive your filtered product.
3. Fill the filter pipet from another pipet.
4. Let the liquid drain out of the filter pipet into your clean vial. Note that you could—could, mind you—put a rubber bulb onto the filter pipet and use the bulb to help push the solution out. Watch out:
 - a. If you push the solution through the cotton too rapidly, you could force filth through the cotton and into the cleaned product.
 - b. Don't *ever* let up on the rubber bulb once you start. You'll suck air and possibly filth off the cotton back into the pipet. In a few cases, where people didn't jam the cotton into the tip, but sort of had the cotton as a large ball wedged in the narrowing part, the cotton would be sucked back into the pipet, and the entire solution, filth and all, would run right out of the pipet.
5. You could—this is rare—blow the cotton jammed in the tip right out.

PIPET FILTERING—SOLIDS

After a recrystallization, you usually collect the new crystals by suction on a Buchner funnel (see Chapter 13, "Recrystallization"). For microscale quantities you may have to use a Hirsch funnel—a tiny Buchner funnel with sloping sides and a flat porous plate (see Chapter 5, "Other Interesting Equipment"). Or you might need the high-tech power of Craig tubes (see Chapter 14, "Recrystallization: Microscale"). Or you might be able to get away with a Pasteur pipet (Fig. 42).

1. Get the vial or tube containing the ice-cold crystalline mixture and stir it a bit with a Mayo-type cotton-plugged pipet—the cotton plug right to the end of the tip.
2. Slowly—there's that word again—push air out of the pipet while you bring the tip to the bottom of the container.
3. Slowly—there's that word yet again—draw solvent into the pipet, leaving crystals behind.

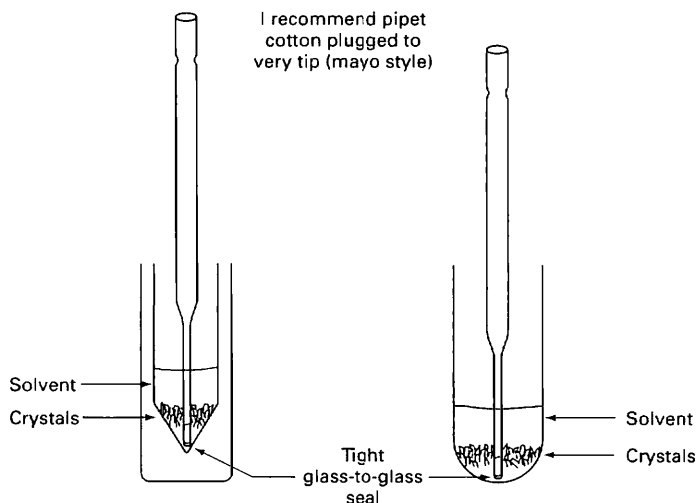


Fig. 42 Pasteur pipet to filter solids.

Now you might want to pack the crystals down a bit by rapping the container on a hard surface. Then repeat the filtration above.

You can wash these crystals with a few drops of cold, fresh solvent and then remove the solvent as many times as is necessary. Eventually, however, you'll have to take the crystals out of the tube and let them dry.

If the tube with crystals has a flattened or even a slightly rounded bottom, you might be able to get away with using an unplugged pipet. The square end of the pipet can fit even a test tube bottom fairly closely, letting solvent in and keeping solvent out. With conical vials, there's more trouble getting a close glass-to-glass contact (not impossible, though), and it might be easier to stick to the Mayo-type plugged pipet (Fig. 42).

In all cases, make sure you keep the crystallization tube cold and that you wait, even the small length of time it takes, for the pipet tip to cool as well. You don't want the pipet tip warming the solution.